

Add/subtract the fractions.

1. $\frac{1}{\sin x} + \frac{2}{\cos x}$

$$\frac{\cos x + 2 \sin x}{\cos x \cdot \sin x}$$

2. $\frac{\cos \alpha}{1 + \sin \alpha} + \frac{1 + \sin \alpha}{\cos \alpha}$

$$\frac{2}{\cos \alpha}$$

3. $\frac{1 + \sin \theta}{1 - \sin \theta} - \frac{1 - \sin \theta}{1 + \sin \theta}$

$$4 \tan \theta \sec \theta$$

4. $1 - \frac{\sin^2 \beta}{1 + \cos \beta}$

$$\cos \beta$$

Split the fraction into two fractions and simplify.

5. $\frac{\csc \theta + 1}{\tan \theta}$

$$(\csc \theta + 1) \cot \theta$$

6. $\frac{1 + \cos \alpha}{\sin \alpha}$

$$\csc \alpha + \cot \alpha$$

7. $\frac{1 - 2 \sin^2 \theta}{\sin \theta \cos \theta}$

$$\csc \cdot \sec - 2 \tan$$

8. $\frac{1 - \tan \mu}{\cot \mu}$

$$\tan - \tan^2$$

Factor the following expressions.

9. $2 \cos^2 \alpha + \cos \alpha$

$$\cos(2 \cos + 1)$$

10. $2 \sin^2 \theta - \sin \theta - 1$

$$(2 \sin + 1) \cdot$$

$$(\sin - 1)$$

11. $\tan^2 \gamma - 4$

$$(\tan + 2) \cdot$$

$$(\tan - 2)$$

12. $2 \sec^2 \alpha - 3 \sec \alpha + 1$

$$(2 \sec - 1) \cdot$$

$$(\sec - 1)$$

Multiply by the conjugate and reduce if possible.

13. $\frac{1 - \cos \alpha}{1 + \cos \alpha}$

$$\frac{\csc^2 - 2 \cot \csc + \cot^2}{\csc}$$

14. $\frac{\csc \theta}{1 + \csc \theta}$

$$\frac{\sec^2 \sin + \sec^2}{\sec^2 \sin + \sec^2}$$

15. $\frac{1 + \sec \beta}{\sec \beta}$

$$\frac{-\sin^2}{\cos(1 - \sec)}$$

16. $\frac{1 - \sin \alpha}{\sec \alpha}$

$$\frac{\cos^2}{\sec + \tan}$$

*17. Find the six trig functions that satisfy the given information using identities. $\csc\theta = -\frac{7}{3}$, $\tan\theta > 0$

*18. Simplify: $\csc\alpha \cos\alpha$

$$\cot\alpha$$

*19. Simplify: $1 + \tan^2(-\alpha)$

$$\sec^2\alpha$$

*20. Simplify: $\tan\beta \cot\beta - \cos^2\beta$

$$\sin^2\beta$$